CONSTRUCTION STANDARD SPECIFICATION

SECTION 08710

DOOR HARDWARE

NOTICE

THIS SECTION MUST BE EDITED BEFORE USE

This guide section can be used for preparing door hardware specifications and hardware schedules for construction projects at Sandia National Laboratories (SNL). SNL has standardized on Sargent locksets. Sargent has several different Lockset Lines. SNL most frequently uses Lines 10 and 11. The Line selection should be matched with the performance requirements of the door; considering security, life-safety and maintenance. Acceptable hardware manufacturers and specific hardware items to be used at SNL are included in this guide. Other hardware items are described generically referencing American National Standards Institute (ANSI) standards developed by Builders Hardware Manufacturers Association (BHMA). The specifier will need to edit this section for a specific project and generate a hardware schedule listing hardware items required for each door opening. Additional hardware items will need to be added and non-applicable items should be deleted. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements and options. Options are indicated by **[ ]**. Notes to assist the specifier in selecting options and editing the specification guide are printed in bold and indicated with *********.

Throughout this product guide specification, references are made to other specification sections that might be contained in the project manual. These references are presented as examples and coordination reminders.

For the final document, all brackets, notes, and blue text shall be deleted from the Section.

CONSTRUCTION STANDARD SPECIFICATION

SECTION 08710

DOOR HARDWARE

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SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes hardware for doors.

******* List other specification sections dealing with work directly related to this section such as the following. *******

B. Related sections:

1. Section 06400, “Interior Architectural Woodwork: Cabinet hardware”.
2. Section 08110, “Steel Doors and Frames”.
3. Section 08210, “Wood Doors”.
4. Section 08361, “Overhead Sectional Steel Doors”: Hardware provided by overhead door manufacturers.

1.02 REFERENCES

******* List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. *******

A. American National Standards Institute (ANSI):

ANSI A115 Set Steel	Steel Door and Frame Preparation for Hardware
ANSI A115 Set Wood	Wood Door Hardware Standard
ANSI A117.1	Specifications for Making Buildings and Facilities Accessible To and Usable by Physically Handicapped People.
ANSI A156.1	Butts and Hinges.
ANSI A156.3	Exit Devices.

ANSI A156.4	Door Controls - Closers.
ANSI A156.6	Architectural Door Trim.
ANSI A156.7	Template Hinge Dimensions.
ANSI A156.15	Closer Holder Release Devices.
ANSI A156.16	Auxiliary Hardware.
ANSI A156.21	Thresholds.
ANSI A156.22	Door Gasketing Systems.
ANSI A156.26	Continuous Hinges
ANSI A612	Specification for Pressure Vessel Plates, Carbon Steel, High Strength, for Moderate and Lower Temperature Service.
ANSI A250.6	Hardware on Steel (Reinforcement-Application)
ANSI J405	

B. American National Standards Institute/Builders Hardware Manufacturer's Association (ANSI/BHMA):

ANSI A156.2	Bored and Preassembled Lock and Latches. Same as BHMA 601.
ANSI A156.19	Power Assist and Low-Energy Power-Operated Doors.

C. American Society of Testing and Materials (ASTM):

ASTM E90	Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems.
ASTM E413	Classification for Rating Sound Insulation.

D. Architectural Hardware Consultant (AHC)

E. Builder hardware Manufacturers Association (BHMA)

F. Door and Hardware Institute (DHI):

Sequence and Format for the Hardware Schedule.

G. Factory Mutual (FM)

H. International Code Council (ICC):

IBC 2000	Positive Pressure Fire Tests of Door Assemblies.

I. International Code Council/American National Standards Institute (ICC/ANSI);

ICC/ANSI A117.1 International Code Council/American National Standards Institute Standard on Accessible and Useable Buildings and Facilities.

M. National Fire Protection Association (NFPA):

NFPA 72 National Fire Alarm

NFPA 80 Fire Doors, Windows.

NFPA 101 Life Safety Code.

N. Underwriters Laboratories (UL):

UL 10C Standard for Positive Pressure Fire Tests of Door Assemblies.

1.03 SUBMITTALS

A. Submit in accordance with Section 01330, “Submittal Procedures”:

1. Product data for each hardware item including function descriptions, materials, finishes, dimensions, power requirements for electrified items, and installation and interface requirements.

2. Shop drawings illustrating special installation requirements and diagrams for wiring electrified items and interface with fire alarm, security, and access control system].

3. Hardware schedule: Format in accordance with DHI Sequence and Format for the Hardware Schedule. Organize hardware sets in same sequence as Hardware Schedule in Part 3.

4. Keying schedule detailing final keying and indexing key sets to designated doors.

5. Certificates documenting:

a. Hardware items comply with ANSI 156, Grade 1 in accordance with Paragraph [1.4.B].

******* Include the following paragraph if fire-rated doors are required. *******

b. Items being provided for fire-rated assemblies have been successfully tested in accordance with Paragraph [1.4.E].

******* Include the following paragraph if sound rated door assemblies are required. *******

c. Sound transmission class: Showing compliance with Paragraph 1.4.F.

6. Manufacturer's instructions for preparing doors and frames to receive hardware and for hardware installation, adjustment, and maintenance.

7. Copy of warranties required by Paragraph [1.6] for review by Contracting Officer.

B. Submit in accordance with Special Construction Specification Section 01780, "Closeout Submittals":

1. Operation and maintenance manuals.

2. Special wrenches, maintenance tools, and accessories as applicable to hardware items and as supplied by hardware manufacturer.

1.04 QUALITY ASSURANCE

A. Supplier qualifications: Hardware shall be scheduled and detailed by Architectural Hardware Consultant (AHC) certified by Door and Hardware Institute (DHI). Hardware consultant shall be available to consult with Contracting Officer regarding hardware submittal, items to be provided, and keying schedule.

B. Hardware shall meet minimum requirements of ANSI A156, Grade 1.

C. Handicapped access: Hardware on doors accessible to handicapped shall comply with ICC/ANSI A117.1

D. Hardware shall be adjusted and demonstrated to function properly. Damaged or defective hardware shall be replaced at no cost to Sandia National Laboratories (SNL).

******* Include and edit the following paragraph if fire-rated doors are required. *******

E. Fire-rated doors: Provide hardware complying with NFPA 80, identical to items tested and listed by Underwriters Laboratories (UL), or other National Recognized testing agency acceptable to SNL Site Fire Marshall. Include positive pressure testing. Units shall bear testing agency labels.

******* Include the following paragraph if sound rated door assemblies including door panel, frame, and hardware are required. *******

F. Sound transmission class: Provide certificate that door assemblies including door panel, frame, and hardware have been tested in accordance with ASTM E90 and ASTM E413 to achieve sound transmission class of STC [43] [_____].

1.05 DELIVERY, STORAGE, AND HANDLING

A. Ship door hardware to site in unopened boxes, clearly labeled with manufacturer's name and item description.

B. Store and protect hardware until needed for installation.

1.06 WARRANTY

A. Provide under provisions of Section 01700, "Contract Closeout":

1. Closers: Ten (10) year warranty against mechanical failure.

2. Exit devices: Three (3) year warranty against mechanical failure.

3. Cylindrical Locks and Latchsets: Seven (7) year warranty against mechanical failure.

4. All other Hardware: One (1) year warranty.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

******* Only approved products may be substituted, except where noted.*******

A. Exit Devices, Electrified Exit Devices and Electrical Power Transfers:

1. Von Duprin; Indianapolis, In.; (www.vonduprin.com).

B. Mechanical Push-Button Combination Locks:

1. Simplex, by Kaba-Ilco, Winston-Salem, NC (www.kaba-ilco.com)

C. Butt Hinges:

1. Stanley; New Britain, CT; (www.stanleyworks.com).

D. Silencers, Door Bumpers, Mop Plates, Kick Plates, Stops/Holders, Flush Bolts, Push/Pull Latches:

1. Trimco; Los Angeles, CA; (www.trimcobbw.com).

E. Electrical Push-Button combination lockset:

1. Hirsch Electronics Corporation; Santa Ana, CA (www.hirshelectronics.com).

F. Spin Dial Combination Locks::

1. Kaba Mas; Lexington, KY; (www.kaba-mas.com).

G. High Security Locks, Electric Exit Device Trim and Electric Locking Hardware:

1. Securitech; (www.securitech.com).

H. Exit Devices and Key Removable Mullions: (Precision Exit Devices recommended for use with Securitech Electrified Trim products).

1. Precision Hardware, Inc.; Romulus, MI;(www.precisionhardware.com).

I. Exit Devices, Locksets, Padlocks, Door Closers, Mullions and Latchsets: (No substitutions allowed, except for Door Closers.)

1. Sargent Manufacturing Company (ASSA Abloy, Inc.); New Haven, CT; (www.sargentlock.com).

J. Electro-magnetic Door Holders:

1. Honeywell; (www.honeywell.com).

K. Thresholds, Door Gasketing Systems and Astragals:

1. National Guard Products, Inc; Memphis, Tennessee; (www.npginc.com).

L. Low-energy, Power Operated Interior Door Openers:

1. Horton Automatics; Corpus Christi, Texas; (www.hortondoors.com).

2. LCN, (www.lcnclosers.com).

2.02 GENERAL HARDWARE SCHEDULE

A. General: Hardware shall be identified by ANSI as Grade One hardware where applicable. Where applicable, function shall be as noted on Contract Documents, or as chosen at time of Submittals.

B. Opening Force: Maximum force for pushing or pulling open door shall be 8.5 pounds (3.9kg) for exterior and 5 pounds (2.3kg) for interior doors.

C. Hand of door: Refer to Drawings for swing of each door leaf. Furnish hardware items suitable for indicated door movement.

D. Base metals: Produce hardware units of basic metal and forming method indicated using the manufacturer's standard alloy, composition, temper, and hardness.

E. Hardware to conform to templates prepared for screw installation.

F. Furnish installation screws with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish of screws to match hardware finish.

G. Hex bolts: Install door closers, door holders, and exit devices on wood doors with through bolts and hex nuts.

H. Where possible, provide concealed fasteners for hardware items, which are exposed when the door is closed. Do not use through bolts for installation where bolt head or nut is exposed on opposite face except where it is not feasible to reinforce the work.

I. Finishes: Finish for all hardware shall be US26D, Plated, Satin Chrome, unless otherwise specified in Construction Documents.

J. Fire Rated Door Hardware: Fire Rated Door Hardware shall be listed and labeled by Underwriters Laboratories (UL) and Factory Mutual (FM) as "Fire Exit Hardware." Exit devices on fire rated doors shall not have dog down capacity.

2.03 BUTT HINGES

******* Electrical Hinges are not allowed.*******

A. Full mortise hinges:

1. Comply with ANSI A156.1 and ANSI A156.7.

2. Type: Full mortise, anti-friction, ball bearing, flat tip, five knuckles, ANSI Grade 1.

3. Hinge weight:

a. Exterior, airlock entry doors, toilet room entry door, and other doors with closers: Heavy weight. Use Stanley FBB168.

b. All other doors: Standard weight. Use Stanley FBB179.

4. Pins:

a. Non-removable: Provide set screw to prevent pin removal when door is closed for:

1) Out-swinging exterior doors.

2) Vault room doors and other outs-winging interior doors with locks.

b. Provide all other doors with non-rising, loose pins.

5. Pin tip: Flat button.

6. Minimum number of hinges per door:

a. Door height to 60 inches: 2.

b. Door height from 60 to 90 inches: 3.

c. Door height from 90 to 120 inches: 4.

d. Door height above 120 inches: 4 plus 1 additional hinge per 30 inches.

7. Minimum hinge height for 1-3/4 inches thick door:

a. Door width to 42 inches: 4-1/2 inches.

b. Door width over 42 inches: 5 inches.

******* Include the following paragraph if concealed monitoring switch is required. *******

8. Concealed switch: To monitor door position and interface with alarm or other security device.

******* Include the following paragraph if geared continuous hinges are required. *******

B. Continuous hinges:

1. Comply with ANSI A156.26.

2. Type: Pinless assembly of three interlocking aluminum extrusions applied to full height of door and frame without mortising. Door leaf and jamb leaf shall be geared together for entire length of hinge and joined by channel extrusion. Vertical loads carried by multiple thrust bearings. Working metal surfaces coated with dry lubricant.

3. Minimum weight capacity for 84 inches high door:

a. Standard duty: 280 pounds.

b. Heavy duty: 540 pounds.

2.04 ELECTRICAL POWER TRANSFER

A. Provide one (1) each Electrical Power Transfer on doors where electrified exit devices or other electrified locking hardware is specified elsewhere in Construction Documents. Use only Von Duprin EPT-10.

2.05 CYLINDRICAL LEVER LOCKSETS

A. Keyed function locksets and Non-Keyed Function Latchsets: Keyed function locksets shall remain secure after withstanding 2400 inch pounds of torque applied to the locked lever. All locksets shall maintain horizontal lever position after two million cycles per ANSI A156.2. All locksets shall be mountable without the use of through bolts and shall fit in a standard 2-1/8" (55MM) bore. Locksets shall fit a minimum door stile width of 4-1/4" (108mm). Lockset levers shall not contain any plastic fillers and shall be made of solid material. Locksets shall have 2-3/4" (70mm) backset, standard. Latchbolt heads shall be one-piece stainless steel, 7/8" (22mm) diameter x ½"(13mm) throw, ¾" (19mm) throw for pairs of doors. All keyed locksets shall be provided with six-pin lock cylinders manufactured by Sargent Manufacturing Company, New Haven, CT. Lock cylinders shall be provided in the Sargent "LA" keyway and shall be "1" bitted. SNL-NM locksmiths will provide proper restricted lock cylinder plugs and keying into the SNL-NM master key system.

******* SNL has standardized on Sargent locksets. Sargent has several different Lockset Lines. SNL most frequency uses Lines 10 and 11. The Line selection should be matched with the performance requirements of the door, considering security, life-safety and maintenance. Select various lock functions required for project and indicate**

function in appropriate hardware sets scheduled in Part 3. Add additional functions as required and delete non-applicable functions. ***
***** Schedule the following function for Privacy Bathroom Function-Single Occupant Bathrooms and Passage Functions. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door: *****

1. Passage Function Latchset; 28-10U15-LL. Latch bolt operated by lever from either side at all times. For all doors, including utility rooms, where keyed locksets, exit devices or other auxiliary locking devices are not specified. Outside lever is locked by push button inside and unlocked by emergency release on outside, by rotating inside lever, or by closing door. Inside lever always active.

2. Privacy Bathroom Function, for Single Occupant Bathrooms; 28-10G65-LL. Outside lever is locked by push button inside and unlocked by emergency release on outside, by rotating inside lever, or by closing door. Inside lever always active.

***** Schedule the following function for Multi-Occupant Toilet Rooms, provide auxiliary latchsets. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door: *****

3. Multi-Occupant Toilet Room door locksets; 24-114P x 808 strike. Latch bolt operated by lever from either side. Outside lever is locked by push button inside and unlocked by emergency release on outside, by rotating inside lever, or by closing door. Inside lever always active.

4. Classroom Function lockset; 28-10G37-LL. Either lever operates latchbolt except when outside lever is locked from inside. Pushing button in inside lever locks outside lever. Lever automatically releases when inside lever is turned or key is rotated in locked outside lever. Push button must be manually released. Latchbolt is operated by key in outside lever or by rotating inside lever. Inside lever always active.

***** Schedule the following function for Entrances requiring locked security at times and remaining open at other times. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door. *****

5. Entrance Function lockset; 28-10G05-LL.

***** Schedule the following function for equipment, store room, and mechanical chase doors, and in electronic access control applications with jamb mounted electric strikes. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door. *****

6. Store Room Function lockset; 28-10G04-LL. Latchbolt operated by lever inside and by key in outside lever. Outside lever always locked and inside lever always active.

******* Schedule the following function for use in Electronic Access Control application using through door circuit in conjunction with electrical power transfer. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door. *******

7. Electromechanically (fail secure) Function lockset; 28-10G71-LL.

******* Schedule the following function for use on Roof Access Doors. The Latchset most frequency used in this application is Sargent 10 Line Series with following functions, but shall be matched with the performance requirements of the door. *******

8. Asylum Function lockset; 28-10G17-LL.

2.06 COMBINATION LOCKSETS

A. Spin Dial Combination Lock: Security lock resistant to X-ray imaging with spyproof centi-spline dial. Provide Kaba Mas Model CDX-08 pedestrian door deadbolt with strike type 1,2,3, or 9. Procure from Defense Supply Center Philadelphia (DSCP), 700 Robbins Avenue, Philadelphia, PA 19111. Ph. 215-737-2218. National Stock Number (NSN) 5340-01-469-5906. If other than #1 strike is needed, call DOD Lock Program Hotline at 800-290-7607.

B. Mechanical Push-Button Combination Lock: Provide Simplex Unican L1000-2B with key bypass. Provide uncombined Falcon core 12607A.

C. Electrical Push-Button Combination Lock: Provide electrical push-button combination locks activated by using keypad to enter personal identification code number. Provide Infographics Keypads & controllers per Contract Documents.

1. Provide mechanical override in event of power failure.

2. System to provide computerized audit trail of usage and access.

3. Keypads, Controllers, etc.: Single keypad installed at door opening: Model as manufactured by Infographics.

2.07 EXIT DEVICES

A. Exit Devices: Provide exit device only where specified on Contract Documents. Exit device latch bolts shall be released by depressing actuating push pad.

1. For single doors and double doors with removable or fixed center mullion, exit device shall be Sargent 80 Series or Precision 1100 Series reversible rim device. The device shall have, appropriate strike and lever handle trim for application and function.

a. For Hollow Metal or Extruded Aluminum Storefront Non-Fire Rated Doors with a minimum stile width of 4 ¾", provide Sargent Model 8888 x ETL with Model 641 strike. Doors with vision lite frames or moldings protruding at device mounting location provide Precision Model 1108 x 39LA with Model 1200-06 strike. At double doors add Precision Model

822 steel removable mullions. Where contract specifies key removable mullion provide Precision Model A-KR822 head cap.

b. For Fire Rated Doors, provide Sargent Model 12-8888 x ETL with Model 649 strike. Doors with vision lite frames or moldings protruding at device mounting location provide Precision Model FL-1108 x 39LA with Model 100-78 strike. At double doors add Precision Model FL-822 fire rated steel removable mullions. Where contract specifies key removable mullion provide Precision Model A-FL-KR822 head cap.

c. For Extruded Aluminum Narrow Stile Storefront Doors with a minimum stile width of 1 ¾" provide Sargent 8513 x ETL or Precision 1408 x 29LA rim device. For double doors use Sargent 650A mullion or Precision 815 mullion.

2. For pair of active doors without center mullion, exit devices on each leaf shall be Sargent 8700 Series or Precision 1200 series surface vertical rod exit devices. The device shall have appropriate strikes and lever handle trim for application and function.

a. For Hollow Metal or Extruded Aluminum Storefront Non-Fire Rated Doors with a minimum stile width of 4 ¾", provide Sargent Model 8713 x 713-8 ETL with Model 629 top strike and 624 bottom strike. Doors with vision lite frames or molding protruding at device mounting location provide Precision Model 1208 x 39LA with Model 1200-06 top strike and 020-97 bottom strike.

b. For Fire Rated Doors, provide Sargent Model 12-8713 x ETL with Model 629 top strike and 624 bottom strike. Doors with vision lite frames or moldings protruding at device mounting location provide Precision Model FL-1208 x 39LA with Model 1200-06 top strike and 020-97 bottom strike.

c. For Extruded Aluminum Narrow Storefront Doors with a minimum stile width of 1 ¾" provide Sargent 8413 x ETL concealed rod device or Precision 1608 x 29LA concealed rod device. For double doors use Sargent 650A mullion or Precision 815 mullion.

3. For Single Doors and Double Doors with removable or fixed center mullion, and which are indicated to be unlocked via electric actuation device (e.g., badge reader, key pad), provide Von Duprin EL99 Series exit device with electric latch retraction or Precision EL 1100 Series exit device with electric latch retraction. The device must be provided with the manufacturers specified power supply, appropriate strike and lever handle trim. All electrical actuated devices actuated via electronic access control systems shall have outside lever trim, which remains in a constant locked position at all times. Key override retracts latch bolt but does not unlock lever.

a. For Hollow Metal or Extruded Aluminum Storefront Non-Fire Rated Doors with a minimum stile width of 4 ¾", provide Von Duprin Model EL99NL x 992L-NL. Doors with vision lite frames or moldings protruding at device mounting location provide Precision Model ELR1103 x 39LA with Model 1200-06 strike. At double doors add Precision Model 822 steel removable mullions. Where contract specifies key removable mullion provide

Precision Model A-KR822 head cap. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT-10.

b. At Fire Rated Doors, provide Von Duprin Model 99-F-EL99NL x 992L-NL or Precision Model FL-ELR1103 x 39LA. At double doors provide Precision Model FL-822 fire rated steel removable mullions. Where contract specifies key removable mullion provide Precision Model A-FL-KR822 head cap. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT-10.

c. For Extruded Aluminum Narrow Storefront Doors with a minimum stile width of 1 ¾" provide Von Duprin EL33NL x 370L or Precision ELR1403 x 29LA rim device. For double doors use Sargent 650A mullion or Precision 815 mullion. Use device manufacturer's specified power supplies and Von Duprin Electric Power Transfer Model EPT-10.

4. Vault Type Rooms (VTR): Provide Kaba Mas Model CDX-08 pedestrian door deadbolt with appropriate strike for door and jamb.

a. Refer to requirements for spin dial combination lock specified in Section 2.6- Spin Dial Combination Lock.

2.08 DOOR COORDINATOR

A. Comply with ANSI A156.3, Grade 1.

B. Provide coordinator at all pairs of active doors without center mullion. Use Sargent Model 3487 with Model 3497 carry open bar.

C. UL listed for fire-rated openings.

2.09 CLOSERS

A. Closers: Closers shall be surface mount type with parallel arms, back check, key control valves, and 50% power adjustments and shall facilitate automatic closure of door. Provide Sargent Model EB350 series closers on exterior doors, interior fire rated doors, doors with electro-magnetic door holders, interior doors with exit devices, push-pull devices, auxiliary latchsets and additional doors indicated on Contract Documents.

B. Compliance:

1. ANSI A156.4, Grade 1 and BHMA Directory of Certified Door Closers

2. ANSI A117.1 for reduced opening force requirements.

3. UL listed for doors without hold-open.

4. UBC 7-2 and UL10 (C) for positive pressure fire test.

C. Operation: One valve controlling closing speed and second valve controlling latching speed. Fully adjustable backcheck and selector valve.

D. Where indicated in Hardware Schedule or functionally required, provide adjustable hold open arm.

E. Where door cannot swing open 180 degrees or as indicated in Hardware Schedule, provide auxiliary stop.

F. Provide brackets, drop plates, through bolts and grommet nuts, and other required accessories for mounting.

G. Cover: Metal with plated finish.

2.10 DOOR TRIM

A. Comply with ANSI A156.6.

B. Kick Plates: Heavy-Duty, 16-gauge (2mm) smooth surface metal. Provide Trimco 1024- 12" x 2" (305mm x 51mm) LDW on push side of doors scheduled for exit devices, on both side of doors with push/pull devices or auxiliary latchsets; ANSI J102.

C. Push/Pull Plates: Heavy-Duty, 4 by 16 inches, straight loop pull; ANSI J405.

2.11 ELECTROMAGNETIC DOOR HOLDERS

A. Comply with ANSI A156.15, Grade 1.

B. Electro-Magnetic Door Holder: Provide electro-magnetic door holder device only when specified in Contract Documents. The device shall be Underwriter's Laboratory (UL) listed and Factory Mutual (FM) approved and shall be fail safe, conforming to NFPA 72, NFPA 80, and NFPA 101. Release device shall be so designed that it may be automatically released by power interruption and manually released by some simple and readily obvious operation.

Provide Honeywell Series S4003 or equal for 120 VAC. Provide appropriate floor mount pedestal where needed for floor mount installation.

1. In new construction, where indicated to be installed on walls, door holder shall be flush mounted.

2. In renovation work, where indicated to be installed on walls, door holder may be surface mounted.

2.12 MANUAL FLUSH BOLTS

A. Comply with ANSI 156.16.

B. Top and bottom Manual Flush Bolts, shall be Trimco 3917.

2.13 ELECTRIC STRIKE

A. Comply with ANSI 156.16.

B. When noted elsewhere in Contract Documents, provide heavy-duty electric strikes fully compatible with door, frame, and hardware specified for intended application. Strike shall have latchbolt monitoring capability.

2.14 LOW-ENERGY POWER OPERATED DOOR OPENERS

A. Low Energy Power Operated Door Openers: On specified doors only, provide power operated door opener(s). The power opener shall be low energy, self-contained electric operating mechanism. It shall be powered open with DC motor working through reduction gears.

1. The motor shall be off when door is in closing mode.

2. The door shall be capable of being manually opened or closed with power on or off without damage to mechanism.

3. The opener shall include the following variable adjustments in compliance with ANSI/BHMA A156.19.

   a. Opening Speed - three to five seconds

   b. Closing Speed - three to five seconds

   c. Time Delay Before Closing - five to twenty-five seconds

4. Opening and closing force, measured 2" (51 mm) out from lock stile of door, shall not exceed 15 pounds (6.8 kg) of force to stop door when operating in either direction.

5. The opener shall include means of turning off opening force when door is stopped for one second. After stopping door, it should then close and opener shall reset itself to accept another signal.

6. The opener shall be mounted in extruded aluminum cover.

7. Provide two (2) 6" (152 mm) round stainless steel push plate control switches marked "Handicapped" on each side of opening, unless otherwise indicated in Contract Documents.

   a. Furnish 120 VAC, 60 cycle, single phase, 15-amp service to the operator.

2.15 AUXILIARY HARDWARE

A. Auxiliary Hardware: Auxiliary hardware shall be provided only where specified herein and/or elsewhere on Contract Documents.

1. Combination stop and holder device shall be Trimco Model 1224-5, manually operated device.

2. Concave wall mount door bumpers shall be provided at doors opening onto adjacent walls. Provide Trimco Model W1276-CCS Series with appropriate fasteners.

3. Floor mount door bumpers shall be provided on doors where wall type door bumpers are not provided. Provide Trimco Model W1210ES Series.

4. Provide Trimco Model 1229A neoprene door silencers on non-fire rated doors. Provide three per each door.

5. Provide flexible silicone rubber smoke seal on fire rated doors in compliance with ANSI A156.22. Use NGP 2525 x Door Size.

6. Provide weather-stripping, door sweep(s), and threshold at exterior doors in compliance with ANSI A156.21 and A156.22.

   a. Provide NGP 160 weather-stripping at all non-fire rated exterior doors.

   b. Provide NGP 200 NA door sweep at exterior doors.

   c. Provide NGP 424E threshold at exterior doors.

7. Astragal:

   a. Provide NGP 125 NGA astragal for all other fire rated and non-fire rated double doors without center mullion where security astragal is not specified.

   b. Provide security astragal on exterior pairs of doors without center mullions and exit devices. Provide NGP 139 SP

8. Automatic door bottoms for both fire rated and non-fire rated doors shall be NGP 420NA. Comply with ANSI A156.22.

2.16 FINISHES

A. Finishes for all door hardware shall comply with ANSI A612, US26D, plated, satin chrome except otherwise scheduled.

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to installation, verify that doors and frames are ready to receive hardware. Verify that hardware is free of surface defects, warpage, and other defects which might impede performance of hardware.

3.02 PREPARATION

A. Prepare doors and frames to receive new hardware items.

1. For Steel Doors and Frames comply with ANSI/DHI A115-Set Steel series.

2. For Wood Doors comply with ANSI/DHI A115-Set Wood series.

3. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

B. Use manufacturer provided templates. Cuts shall be straight and smooth without jagged edges. File and grind edges to provide smooth appearance.

C. Reinforce cutouts as required to provide rigidity and support.

3.03 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions.

B. Locate hardware from finished floor in accordance with DHI publications unless shown otherwise on Drawings.

1. Butt Hinges: Install minimum of 1-1/2 pair per door on doors no taller than 7’ feet 2” inches (2.18 m), otherwise install two (2) pair butt hinges per door.

2. Lock and Latches: Install locks and latches at 36 inches (914 mm) above bottom of door.

3. Dial and Push Button Combination Locks: Install per manufacturer's installation instructions at 42” inches (1.07 m) above finish floor.

4. Push Plate Control Switches: Install 6" (152 mm) round push plate control switches at 9" (229 mm) and 39" (991 mm) above finish floor to center line of round plates. Two (2) plates are required on each side of opening. .

5. Thresholds: Set thresholds for exterior doors in full bed of sealant complying with requirements specified in Section 07900, “Joint Sealants.”

C. Protect hardware finish until painting and other work is completed.

D. Adjust operating hardware, thoroughly clean, and polish in accordance with manufacturer's instructions.

3.04 SCHEDULE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of are indicated in Schedule. Products are identified by [ANSI 156 reference numbers] [and] [using manufacturer's hardware model numbers].

B. Manufacturer's product designation: Manufacturers are listed for hardware items to establish minimum requirements. Provide product designated in Paragraph 2.1 for specific hardware category.

C. Items shall be proper type for attaching securely to specific project substrate.

END OF SECTION